

Title (en)

METHOD FOR THE SIMULTANEOUS PRODUCTION OF ETHANOL AND A FERMENTED, SOLID PRODUCT

Title (de)

VERFAHREN ZUR SIMULTANEN HERSTELLUNG VON ETHANOL UND EINEM FERMENTIERTEN, FESTEN PRODUKT

Title (fr)

PROCÉDÉ POUR LA PRODUCTION SIMULTANÉE D'ÉTHANOL ET D'UN PRODUIT SOLIDE FERMENTÉ

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Application

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Abstract (en)

[origin: WO2013050456A1] The invention relates to a method for the simultaneous production of a fermented, solid product and ethanol comprising the following steps: 1) providing a mixture of milled or flaked or otherwise disintegrated biomass, comprising oligosaccharides and/or polysaccharides and live yeast in a dry matter ratio of from 2:1 to 100:1, and water; 2) fermenting the mixture resulting from step (1) under conditions where the water content in the initial mixture does not exceed 65 % by weight, for 1-36 hours at a temperature of about 25-60°C under anaerobic conditions; 3) incubating the fermented mixture resulting from step (2) for 0.5-240 minutes at a temperature of about 70-150°C; and 4) separating wet fermented, solid product from the fermented mixture resulting from step (3); further comprising either a) that the fermentation in step (2) is performed in one or more interconnected paddle worm or continuous worm conveyors with inlet means for the fermentation mixture and additives and outlet means for the ferment as well as control means for rotation speed, temperature and pH, or b) that one or more processing aids are added in any of steps (1), (2) and (3) and further comprising a step of 5) separating crude ethanol from the fermented mixture in step (2) by vacuum and/or in step (3) by vacuum or by injection of steam and condensing the surplus stripping steam. The invention further relates to the products of this method as well as uses thereof.

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CN 104185680 A 20141203; CN 104185680 B 20180410; CN 107653277 A 20180202; CN 107653277 B 20220617; DK 2764110 T3 20230109;
EA 031661 B1 20190228; EA 201490738 A1 20140730; EA 201891940 A2 20190131; EA 201891940 A3 20190628; EP 2764110 A1 20140813;
EP 2764110 B1 20221102; EP 4159868 A1 20230405; ES 2934344 T3 20230221; HK 1201073 A1 20150821; IL 231733 A0 20140528;
IL 231733 B 20190131; IN 3405DEN2014 A 20150605; JP 2014530600 A 20141120; JP 2018042561 A 20180322; JP 6267122 B2 20180124;
KR 101896741 B1 20181004; KR 20140077917 A 20140624; MY 166856 A 20180724; NZ 622442 A 20150626; PL 2764110 T3 20230220;
SG 11201400592P A 20140828; UA 116335 C2 20180312; US 10047379 B2 20180814; US 11078500 B2 20210803;
US 2014288193 A1 20140925; US 2017233767 A1 20170817; US 2019002929 A1 20190103; US 9528128 B2 20161227;
ZA 201402025 B 20150128

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EP 2012069601 W 20121004; AU 2012320505 A 20121004; BR 112014008020 A 20121004; CA 2849349 A 20121004;
CL 2014000840 A 20140404; CN 201280054468 A 20121004; CN 201710126804 A 20121004; DK 12767006 T 20121004;
EA 201490738 A 20121004; EA 201891940 A 20121004; EP 12767006 A 20121004; EP 22203832 A 20121004; ES 12767006 T 20121004;
HK 15101557 A 20150212; IL 23173314 A 20140327; IN 3405DEN2014 A 20140428; JP 2014533886 A 20121004; JP 2017202534 A 20171019;
KR 20147009870 A 20121004; MY PI2014700785 A 20121004; NZ 62244212 A 20121004; PL 12767006 T 20121004;
SG 11201400592P A 20121004; UA A201404804 A 20121004; US 201214349170 A 20121004; US 201615345725 A 20161108;
US 201816022308 A 20180628; ZA 201402025 A 20140319